CLAIMS:

1. A method of purifying a polymeric material, comprising:

melt blending poly(arylene ether) and poly(alkenyl aromatic) in an extruder to form a melt; and

melt filtering the melt through a melt filtration system to produce a filtered polymeric material;

wherein the melt has a residence time in the extruder of less than or equal to about 5 minutes.

2. The method of claim 1, wherein the filtered polymeric material is substantially free of visible particulate impurities.

3. The method of claim 1, wherein the filtered polymeric material is substantially free of particulate impurities having a diameter of about 10 micrometers or greater.

4. The method of claim 1, wherein the melt blending and the melt filtering occur in the same extruder.

5. The method of claim 1, wherein the melt filtration system comprises a sintered-metal filter, a metal mesh filter, a fiber metal felt filter, a ceramic filter, or a combination comprising at least one of the foregoing filters.

6. The method of claim 1, wherein the melt filtration system comprises a filter having a geometry that is cone, pleated, candle, stack, flat, wraparound, or a combination comprising at least one of the foregoing geometries.

7. The method of claim 1, wherein the melt filtration system comprises a continuous filtration system or a batch filtration system.

8. The method of claim 1, wherein the melt filtration system comprises a filter having a pore size of about 0.5 to about 200 micrometers.

9. The method of claim 1, wherein the melt filtration system comprises a filter having a pore size of about 1.0 to about 15 micrometers.

10. The method of claim 1, wherein the melt filtration system is maintained at a temperature of about 260°C to about 380°C.

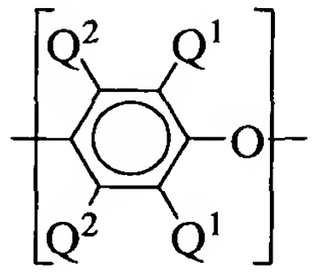
11. The method of claim 1, wherein the extruder is a twin screw counter-rotating extruder, a twin screw co-rotating extruder, a single screw extruder, a single screw reciprocating extruder, or a ring extruder.

12. The method of claim 1, wherein the extruder further comprises a melt pump.

13. The method of claim 1, further comprising pelletizing the filtered polymeric material.

14. The method of claim 1, wherein the melt has a residence time in the extruder of less than or equal to about 1 minute.

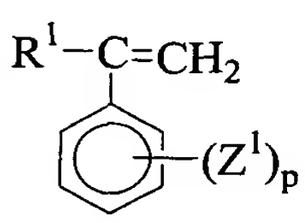
15. The method of claim 1, wherein the poly(arylene ether) comprises a plurality of structural units of the structure



wherein for each structural unit, each Q^1 is independently halogen, primary or secondary C_1-C_7 alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; and each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms.

16. The method of claim 1, wherein the poly(arylene ether) has an intrinsic viscosity of about 0.10 to about 0.60 deciliters per gram as measured in chloroform at 25°C.

17. The method of claim 1, wherein the poly(alkenyl aromatic) contains at least 25% by weight of structural units derived from an alkenyl aromatic monomer of the formula



wherein R^1 is hydrogen, C_1-C_8 alkyl, or halogen; Z^1 is vinyl, halogen or C_1-C_8 alkyl; and p is 0 to 5.

18. The method of 17, wherein the poly(alkenyl aromatic) has a weight average molecular weight in the range of about 100,000 to about 500,000.

19. The method of 1, wherein the poly(alkenyl aromatic) is atactic crystal polystyrene.

20. The method of claim 1, wherein the filtered polymeric material comprises about 90 to about 10 percent by weight of the poly(arylene ether) and about 10 to about 90 percent by weight of the poly(alkenyl aromatic).

21. The method of claim 1, wherein the filtered polymeric material comprises about 60 to about 30 percent by weight of the poly(arylene ether) and about 40 to about 70 percent by weight of the poly(alkenyl aromatic).

22. The method of claim 1, wherein the filtered polymeric material further comprises flame retardants, mold release agents, lubricants, antioxidants, thermal stabilizers, ultraviolet stabilizers, pigments, dyes, colorants, anti-static agents, conductive agents, or a combination comprising at least one of the foregoing additives.

23. The method of claim 1, further comprising compounding the poly(arylene ether) and poly(alkenyl aromatic) prior to melt blending.

24. The method of claim 23, wherein the compounding is performed in a counterrotating conical extruder, or a counterrotating extruder.

25. The method of claim 1, further comprising:

filtering a solution comprising solvent, poly(arylene ether), and poly(alkenyl aromatic) through a solution filtration system to form a filtrate;

removing solvent from the filtrate to form a concentrate comprising poly(arylene ether) and the poly(alkenyl aromatic); and

feeding the concentrate to the extruder to form the melt.

26. A method of purifying a polymeric material, comprising:

melt blending about 60 to about 30 weight percent of poly(phenylene ether) and about 40 to about 70 weight percent of polystyrene based on the total weight of poly(phenylene ether) and polystyrene in an extruder to form a melt; and

melt filtering the melt through a melt filtration system to produce a filtered polymeric material, wherein the filtered polymeric material is substantially free of visible particulate impurities; and

wherein the melt has a residence time in the extruder of less than or equal to about 1 minute.

27. A method of purifying a polymeric material, comprising:

melt blending poly(arylene ether) and poly(alkenyl aromatic) in a twin screw extruder to form a melt; and

melt filtering the melt through a melt filtration system to produce a filtered polymeric material;

wherein the extruder has a specific throughput rate of about 0.5 kg/cm^3 to about 8 kg/cm^3.

28. An article comprising the filtered polymeric material prepared by the method of claim 1, wherein the article is formed by injection molding, blow molding, extrusion, sheet extrusion, film extrusion, profile extrusion, pultrusion, compression molding, thermoforming, pressure forming, hydroforming, or vacuum forming.

29. A data storage medium comprising the filtered polymeric material prepared by the method of claim 1.